Preparation of key compounds. Compound 2. 1-ethynylpyrene (0.142 mg, 0.63 mmol) was dissolved in anhydrous THF (10 mL) under Argon. n-Butyllithium (1.55 M, 0.51 mL) was added at -78°C and the mixture was stirred at -78°C for 1 h and at room temperature for half an hour. The dark green solution was then transferred via cannula to a solution of 4,4-difluoro-1,3,5,7,8 pentamethyl-2,4-diethyl-4-bora-3a, 4a-diaza-s-indacene (0.1 g, 0.31 mmol) in anhydrous THF (20 mL). The solution was stirred at room temperature for 30 min, until the complete consumption of the starting material was observed by TLC. Water was added (5 mL), and the solution was extracted with CH$_2$Cl$_2$ (20 mL). After evaporation, the organic layer was purified by column chromatography on alumina (CH$_2$Cl$_2$/cyclohexane, 20:80), followed by a recrystallization in CH$_2$Cl$_2$/Hexane, yielding the desired compound (0.076 g, 30%). $^1$H NMR (CDCl$_3$, 400 MHz) : $\delta$ = 8.75 (d, 2H, $^3J$ = 9.0 Hz), 8.16-7.96 (m, 16H), 3.11 (s, 6H), 2.74 (s, 3H), 2.56 (q, 4H, $^3J$ = 7.5 Hz), 2.45 (s, 6H), 1.17 (t, 6H, $^3J$ = 7.5 Hz); $^{13}$C{$^1$H}NMR (CDCl$_3$, 100 MHz): 152.1, 140.0, 134.7, 132.8, 132.1, 131.4, 131.3, 130.5, 130.4, 129.7, 127.8, 127.43, 127.38, 126.4, 126.0, 125.3, 125.11, 125.08, 124.61, 124.57, 124.4, 94.4, 17.6, 17.4, 15.2, 14.8, 14.5; $^{11}$B{$^{1}$H}NMR (CDCl$_3$, 128 MHz): -16.8 (s); UV-Vis (CH$_2$Cl$_2$) $\lambda$ nm ($\varepsilon$, M$^{-1}$ cm$^{-1}$) = 516 (73000), 371 (95000), 350 (69000), 286 (93000), 275 (53000), 248 (86000), 241 (80500); IR (KBr): $v$ = 2960 (s), 2293 (m), 1599 (s), 1430 (s), 1184 (s), 978 (s); sFAB$^+$ m/z (nature of peak, relative intensity): 731.2 ([M+H]$^+$, 100), 505.2 ([M-pyr=]$,^+$, 25); Anal. Calcd for C$_{54}$H$_{43}$BN$_2$: C, 88.76; H, 5.93; N, 3.83. Found: C, 88.57; H, 5.77; N, 3.65.

**Compound 3d.** To a solution of 3c (30 mg, 0.03 mmol) in 10 mL of CH$_2$Cl$_2$ were added dimethylaminopyridine (8.4 mg, 0.06 mmol), EDCI (12 mg, 0.06 mmol), and N-hydroxysuccinimide (7.2 mg, 0.06 mmol). The mixture was stirred at room temperature, for 1 h, until the complete consumption of the starting material was observed by TLC. The solution was then washed with water (10 mL), dried over MgSO$_4$, and purified by chromatography on a column packed with silica (CH$_2$Cl$_2$). Recrystallization in CH$_2$Cl$_2$/Hexane gave pure 3d (18
mg, 54% yield). $^1$H NMR (CDCl$_3$, 300 MHz) : 8.78 (d, 2H, $^3J = 9.1$ Hz), 8.17-7.96 (m, 16H), 7.56 (d, 2H, $^3J = 8.3$ Hz), 7.39 (d, 2H, $^3J = 8.3$ Hz), 3.14 (s, 6H), 2.9 (s, 4H), 2.73 (t, 2H, $^3J = 7.1$ Hz), 2.53 (q, 4H, $^3J = 7.5$ Hz), 2.04-1.94 (m, 2H), 1.82-1.73 (m, 2H), 1.43 (s, 6H), 1.10 (t, 6H, $^3J = 7.5$ Hz); $^{13}$C{$^1$H}NMR (CDCl$_3$, 75 MHz): 169.2, 168.2, 154.2, 136.7, 136.0, 133.3, 132.35, 132.34, 132.28, 131.8, 131.5, 130.5, 129.8, 129.4, 128.9, 127.9, 127.6, 127.5, 126.4, 126.1, 125.2, 124.8, 124.4, 124.3, 120.7, 90.5, 30.7, 27.8; 25.8, 24.0, 19.2, 17.6, 15.0, 14.7, 12.3; $^{11}$B{$^1$H}NMR (CDCl$_3$, 128 MHz): -8.98 (s); UV-Vis (CH$_2$Cl$_2$) $\lambda$ nm ($\varepsilon$, M$^{-1}$ cm$^{-1}$) = 523 (55000), 370 (70000), 350 (56000), 285 (81000), 274 (57000), 248 (88000); IR (KBr): $\nu$ = 3435 (m), 2960 (s), 2927 (s), 2230 (m), 2169 (m), 1741 (s), 1543 (s), 1431 (s), 1180 (s), 978 (s), 848 (s); Anal. Calcd for C$_{70}$H$_{56}$BN$_3$O$_4$.CH$_2$Cl$_2$: C, 77.60; H, 5.32; N, 3.82. Found: C, 77.54; H, 5.28; N, 3.72.

**Labelling and imaging experiments.** BSA (Bovine Serum Albumine) was from Sigma (Sigma-Aldrich Co., St. Louis, MO). Fluorescein-labeled rabbit immunoglobulin (2.3:1 fluorescein/antibody labeling ratio) was purchased from Dako (Glostrup, Denmark). Imaging experiments were performed using an epifluorescence microscope (Olympus BX 60, Olympus Optical, Tokyo, Japan) equipped with a USH-102D 100 Watt mercury excitation lamp (Ushio Inc, Tokyo, Japan). Measurements were performed using either a wide-band UV excitation cube (U-MWU: excitation filter 330-385 nm; emission filter >420 nm) or a fluorescein-isothiocyanate excitation cube (U-MWIBA2: excitation filter 460-490 nm; emission filter 510-550 nm). The fluorescence signal was acquired by means of an ultrasensitive, cryogenically cooled CCD camera (LN/CCD, Princeton Instruments, Roper Scientific, Trenton, NJ), using a 500-ms acquisition time. Quantitative evaluation of the luminescence images was done using the Metamorph image analysis software package (Universal Imaging Corporation, Downingtown, PA). Sample spots (diameter ~ 800 µm) were deposited on silanized microscope glass slides (Sigma-Aldrich Co., St. Louis, MO) by means of a glass slide microarrayer (BioGene, Kimbolton, UK); the amount of sample in each spot was evaluated from the volume of solution deposited (~3 nL).